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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.          | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/747,722  | 12/29/2003  | Axel Preusse         | 2000.109700                  | 5854             |
| 23720   | 7590        | 11/03/2004           | EXAMINER                     |                  |
| WILLIAMS, MORGAN & AMERSON, P.C.<br>10333 RICHMOND, SUITE 1100<br>HOUSTON, TX 77042 |             |                      | WOJCIECHOWICZ, EDWARD JOSEPH |                  |
|   |             |                      | ART UNIT                     | PAPER NUMBER     |
|   |             |                      | 2815                         |                  |

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                  |                                |   |
|------------------------------|----------------------------------|--------------------------------|---|
| <b>Office Action Summary</b> | Application No.<br>10/747,722    | Applicant(s)<br>PREUSSE ET AL. |   |
|                              | Examiner<br>Edward Wojciechowicz | Art Unit<br>2815               |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 19-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-16 and 18 is/are rejected.
- 7) ☒ Claim(s) 9 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8-2-04</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

***Election/Restrictions***

Applicant's election of claims 1-18 in the reply filed on 8-13-04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 19-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8-13-04.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 2, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (6,784,051). The Lee patent teaches the inventive process whereby the edge of a substrate is etched to remove part of a metal stack and an adjacent insulating layer from the edge of the substrate. See, for example, Fig. 4B of Lee, and the discussion at col. 6, l. 29-32.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6, and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and further in view of Hara et al (6,451,696). While the Lee reference shows the basic inventive concept of the invention, it is silent as to the specific etchants used to remove the metal stack and insulating layer from the edge of the substrate. Hara shows a related process which also specifically teaches the use of the same etchants claimed in the invention. For example, at col. 6, l. 50-55, Hara discloses that diluted mixtures of nitric acid and hydrofluoric acid may typically be used in the processing of semiconductor substrates to remove not only metal layers, but also the dielectric films adjacent to the metal stack.

In addition, at col. 6, l. 34-39, Hara teaches that different etchants may be used sequentially (as recited in applicant's claims 4-6 and 16) so as to remove the unwanted layers sequentially, as claimed.

Claims 7, 10, 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and further in view of Hara and Hongo et al (6,615,854). While the references to Lee and Hara, discussed above, teach the inventive process for removing metal layers from the edge of a semiconductor substrate, they do not specifically mention the use of copper as one of the metals being removed. Hongo, which also teaches the removal of unwanted metals from the edge of a semiconductor wafer, specifically mentions that copper is usually one of the metals that is typically removed during this process. See, for example, Hongo's teaching at col. 2, l. 1-5. In this same recitation, Hongo teaches that the etchant may also be applied to the back side of the substrate, as recited in applicant's claims 10 and 18. In addition, Hongo's recitation at col. 1, l. 56, that the copper layer is typically plated, would meet the limitation of claim 11 that the copper is formed by an electro-chemical process.

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***Allowable Subject Matter***


Claims 9 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Wojciechowicz whose telephone number is 571-272-1739. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EW: ew

  
**EDWARD WOJCIECHOWICZ**  
**PRIMARY EXAMINER**

Edward Wojciechowicz  
Primary Examiner  
Art Unit 2815